PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
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PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	13 JANUARY 2006 (13.01.2006)
Applicant's or agent's file reference OP05-1057	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/KR2005/003717	04 NOVEMBER 2005 (04.11.2005)	05 NOVEMBER 2004 (05.11.2004)

International Patent Classification (IPC) or both national classification and IPC

A61K 31/7125(2006.01)i

Applicant

KIM, Tae-Yoon et al

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea	12 JANUARY 2006 (12.01.2006)	KIM, Hee Sue
Facsimile No. 82-42-472-7140		Telephone No.82-42-481-560

Form PCT/ISA/237 (cover sheet) (April 2005)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/KR2005/003717

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material
   - ☒ a sequence listing
   - ☐ table(s) related to the sequence listing

   b. format of material
   - ☐ on paper
   - ☒ in electronic form

   c. time of filing/furnishing
   - ☐ contained in the international application as filed.
   - ☒ filed together with the international application in electronic form.
   - ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/KR2005/003717

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	1-19	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

2. Citations and explanations :

The present invention relates to
therapeutic use of CpG oligodeoxynucleotides for skin diseases, more precisely a pharmaceutical composition containing an effective amount of a CpG oligodeoxynucleotide represented by the following formula:[formula] SYYSSACGTTSNYRAWMYTC (SEQ ID NO. 1) wherein S is G or C; Y is C or T; N is any one selected from the group consisting of A, G, T and C; R is G or A; W is A or T; and M is A or C, and wherein the CpG oligodeoxynucleotide comprises at least two unmethylated CpG motifs,
a method for inhibiting a Th2 cytokine and/or inducing a Th1 cytokine, and
a method for stimulating an immune response and a method for treating or preventing a skin disease which comprises administering to a subject in need thereof an effective amount of CpG oligodeoxynucleotide same as that of the above-mentioned pharmaceutical composition.

The following documents have been considered for the purpose of this report:
D1 = WO 2004/078772 A1 (16 September 2004)
D2 = WO 01/93905 A1 (13 December 2001)

D1 describes oligonucleotides for stimulating immune response. The oligonucleotides may be used as an immune stimulator(or an adjuvant), and used for immune response rebalance. D2 describes immunostimualtory oligodeoxynucleic acid molecule (ODN) having the structure according to formula (I).

(Continued on Supplemental Sheet.)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of :

Box. V

1. Novelty

The cited documents describe the general state of the art. The CpG oligodeoxynucleotides represented by the following formula: SYYSSACGTTSNYRAWMYTC of the present invention is different from the oligonucleotides of D1 and oligodeoxynucleic acid molecule (ODN) of D2. Also a therapeutic use of CpG oligodeoxynucleotides for skin diseases is not disclosed in any of the prior art. Therefore, the subject of claims 1-19 can therefore be considered novel under PCT Article 33(2).

2. Inventive Step

Even though D1 and D2 are relevant to the present invention, there is no indication in cited documents which would have led the skilled person to use of the CpG oligodeoxynucleotides represented by the following formula: SYYSSACGTTSNYRAWMYTC as as therapeutic agent for skin diseases. Also, It could not be foreseen from the cited document that the advantages such as a physiological activity that controls the Th1/Th2 immune response balance by inhibiting a Th2 cytokine and/or by inducing a Th1 cytokine, the increased expression of the surface molecules of dendritic cells (e.g. MHC class III, CD80, and CD86) in a concentration-dependent manner, and the induced proliferation of both T lymphocytes and peripheral blood mononuclear cells, the effect of treating a skin disease or of improving a skin disease condition by virtue of the above-mentioned activities as disclosed on examples of the present invention, can be obtained by using the CpG oligodeoxynucleotides represented by the following formula: SYYSSACGTTSNYRAWMYTC. Therefore, the subject-matter of claims 1-19 is considered to involve an inventive step (Art. 33(3) PCT)

3. Industrial Applicability

The subject matter of claims 1-19 is considered to be industrially applicable under PCT Article 33(4).